

## **NEBRASKA PRACTICE DOCUMENTATION REQUIREMENTS**

### **IRRIGATION WATER MANAGEMENT (449)**

#### **I. GENERAL**

Minimum documentation requirements for irrigation water management are outlined below. Documentation for associated practices or system components shall follow the appropriate practice documentation requirements. Additional documentation requirements can be found in the General Documentation Requirements section of the Nebraska Practice Documentation Requirements Manual.

##### **A. References**

1. National Engineering Manual (NEM)
2. NRCS National Environmental Compliance Handbook
3. NRCS Cultural Resources Handbook
4. Nebraska electronic Field Office Technical Guide (eFOTG), Section IV Conservation Practice Standard – Irrigation Water Management, 449
5. National Engineering Handbook (NEH), Part 650, Chapter 15
6. NEH, Part 652 – Irrigation Guide
7. Nebraska Supplements to the NEH, Part 652
8. NEH, Part 623, Section 15, Chapters 1,2,3 and 9
9. Irrigation Water Management Planning Worksheets
10. NebGuide(s) and NebFact(s)
11. Irrigation Management Home Study Course, IANR, University of Nebraska
12. Computer software – IWR, WinSRFR, Surface, SPAW, CPNozzle, CPED, FIRI or other software as applicable
13. Local supplemental criteria

#### **II. RESOURCE INVENTORIES AND SURVEYS**

##### **A. General inventory**

1. Management plan objectives
2. Yield goals
3. Resource concerns that have a direct impact on the IWM plan

##### **B. Design Investigations**

1. Irrigation system layout, operation and current management level.
2. Soils – types, texture and intake rate, available water holding capacity (AWC), irrigation limitations and/or restrictive layers.
3. Crops – types, tillage practices, water use, peak consumptive use.
4. Water – supply, source, availability, flow rates, volume, seasonal variation, quality, delivery, pertinent well and pumping plant information.
5. Flow measurement device(s) – existing or planned.
6. Acceptable Management Allowable Depletion (MAD) level
7. Soil/water balance measurement or indicator – existing or planned
8. Location of utilities and power sources including the potential of interruptible service / load control.

- C. Environmental Inventory
  - 1. NEPA inventory of resources -- form NE-CPA-52 must be completed by NRCS during planning.
  - 2. Wetland effects, if applicable.
  - 3. Archeological/Historical/Cultural Resources.
    - a. Complete all continuing environmental requirements stemming from planning as expressed in the General Documentation Requirements section of the Nebraska Practice Documentation Requirements Manual.

### III. DESIGN

- A. Computations and analysis of associated IWM plan may include but not limited to:
  - 1. Irrigation system ET rates
    - a. Design daily rate provided by the irrigation system
    - b. Crop maximum daily consumptive use rate, based upon NRCS, University or equivalent published rates
    - c. Total seasonal crop water use
  - 2. Soil / Water balance measurement (choose one)
    - a. Historic crop water use
    - b. Manual measurement
    - c. Automated measurement
  - 3. Soils
    - a. Soils map
    - b. Soils description, (i.e. Soil Data Viewer).
    - c. Available water holding capacity (AWC) within the irrigated area
      - 1) Nebraska Planning Sheet 17 or equivalent
  - 4. Effective rainfall
  - 5. Flow measurement device design
  - 6. Depth of application (gross and net)
  - 7. Rate of application
  - 8. Uniformity of application
  - 9. Runoff and deep percolation analysis / potential (CP Nozzle, etc)
  - 10. Site visit schedule
- B. Permits and Approvals
  - 1. Applicable permits associated with the practice and implementation of the IWM plan

### IV. PLANS AND SPECIFICATIONS

- A. Plans
  - 1. Conservation Plan Map
    - a. Details of irrigation distribution layout
    - b. Details of critical IWM components
      - 1) Flow measurement device
      - 2) Rain gauge(s)
      - 3) Soil/water balance measurement device(s)
      - 4) ET measuring device(s)
      - 5) Irrigation system control panel

2. IWM Scheduling Plan
  - a. When to irrigate – the trigger points, MAD
  - b. How much to irrigate
  - c. Documentation of decisions (choose one)
    - 1) NE-ENG-80
    - 2) NE-ENG-80I
    - 3) NE-ENG-80A
    - 4) NE-ENG-79A
    - 5) Computer generated graphical output
    - 6) Third Party recommendation or service
    - 7) Equivalent record keeping worksheets or forms
- B. Specifications
  1. Component installation details
- C. Operation and Maintenance (O&M) Plan
  1. As needed to operate and maintain the practices and components of those practices identified in IWM Plan.
- D. Plans, Specifications, O&M Plan Delivery
  1. Case folder
  2. Transmittal letter copy

## V. LAYOUT

- A. IWM plan review with the system operator /manager
  1. Occurs prior to the irrigation season, with potential follow-up meetings throughout the season
  2. Discussion of all topics within the “Plans and Specifications” category
- B. Modifications of IWM plan as required
- C. Installation instructions and layout for IWM practice components as needed
- D. Certification of compliance with all federal, state, and local laws and regulations as well as any reporting requirements affiliated with these laws and regulations

## VI. COMPLIANCE CHECKING

- A. Basic IWM requirements
  1. IWM plan implementation (field visits during the irrigation season and documented decisions)
    - a. Minimum Required information:
      - 1) Producer’s Name
      - 2) Location (legal description)
      - 3) Irrigated Area (acres)
      - 4) Planting data and Crop grown
      - 5) Available water supply output, gpm
      - 6) Available Water at Field Capacity in root zone, inch (AWC)
      - 7) Management Allowed Depletion, inch (MAD)
      - 8) Depth of effective rain events for a given time period, inch (+)
      - 9) Evapotranspiration rate of crop (ET) for given time period, inch (-)
      - 10) Soil Moisture available to crop at root depth, inch

- 11) Depth of irrigation applied for given time frame, inch (+)
  - b. Acceptable Forms:
    - 1) NE-ENG-80
    - 2) NE-ENG-79A
    - 3) Other equivalent: worksheets, forms or computer software output (Excel)
  - c. Field notes (recommended)
    - 1) Notes of field visits done throughout the irrigation season
    - 2) Modifications made during the season
  - d. Time frame shall not exceed one (1) week period
- B. Intermediate IWM Requirements
- 1. IWM equipment purchased in first year of contract,
    - a. Required documentation: date of purchase, installed location, make and model, number of sensors installed
  - 2. IWM Plan implementation
    - a. Minimum Required information:
      - 1) Producers Name
      - 2) Location (legal description)
      - 3) Irrigated Area (acres)
      - 4) Sensor type: Electrical Resistance, Capacitance or other
      - 5) Number of Sensors and Installation depth, inch
      - 6) Planting data and Crop grown
      - 7) Available water supply output, g.p.m.
      - 8) Available Water at Field Capacity in root zone, inch (AWC)
      - 9) Crop Root Depth, inch
      - 10) Depth of effective rain events, inch
      - 11) Sensor readings for given root depth, inch
      - 12) Irrigation trigger level, inch
      - 13) Depth of irrigation applied, inch
    - b. Acceptable form(s) of documentation:
      - 1) NE-ENG-80I – may be used during the season for IWM, final compliance based on continuous data
      - 2) Computer generated graphical output that contains: Date, Soil Water Content, AWC, and MAD
        - a) Producer may attach a separate sheet to graphical output to satisfy items 1 – 7 above.
    - c. Field Notes (recommended)
      - 1) Notes of field visits done throughout the irrigation season
      - 2) Modifications made during the season
    - d. Data logger shall be of continuously recording type
- C. Advanced IWM Requirements
- 1. All documentation requirements of Intermediate apply to Advanced
  - 2. IWM equipment purchased in first year of contract with third party service provider providing IWM monitoring and recommendations the subsequent years.
  - 3. Additional IWM Plan implementation requirements
    - a. Name of service provider
    - b. Documentation to producer from third party vendor or service provider
      - 1) Documentation shall identify the field ID or name and range of dates service was provided
    - c. Alternative form: NE-ENG-80A may be used during the season for IWM, final compliance based on continuous data

- D. Applicable to all forms of IWM
  - 1. Compliance with all laws and regulations
- E. Irrigation season ending submittals to NRCS
  - 1. A completed record keeping worksheet (i.e.: NE-ENG-80, 80I, 80A, 79A or equivalent) outlined in Section VI.
  - 2. Field notes relating to the implementation and operation of the IWM plan